

Patent claims

1. A method for labeling and identifying solid,
liquid and gaseous substances (S1-n),

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wherein labeling is carried out by selecting at
least one nucleic acid sequence from a first group
of predefined nucleic acid sequences (N1-n) having
in each case an identification sequence section
(IDS1-n) and adding it to the substance (S1-n),

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wherein a second group of further nucleic acid
sequences (N'1-n) which have in each case a
detection sequence section (IDP1-n) complementary
to one of the identification sequence sections
(IDS1-n) is provided for identification,

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wherein first melting points of hybrids formed
from the identification sequence sections (IDS1-n)
together with the detection sequence sections
(IDP1-n) complementary thereto differ by not more
than 5°C from one another and

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second melting points of not completely
complementary hybrids from the identification
sequence sections (IDS1-n) and detection sequence
sections (IDP1-n) are more than 5°C lower than the
lowest of the first melting points and

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wherein identification is carried out by
contacting the nucleic acid sequence(s) (N1-n)
selected from the first group with the further
nucleic acid sequences (N'1-n) of the second group
under predefined hybridization conditions and
detecting hybridization.

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2. The method as claimed in claim 1, wherein the
identification sequence section (IDS1-n) is

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located between two primer binding sequence sections (PBS1, PBS2).

3. The method as claimed in claim 1 or 2, wherein in
5 each case two nucleic acid sequences (N1-n) have a
part section (IDS-A, IDS-B) of a common
identification sequence section (IDS1-n) at their
5' end and a primer binding sequence section is
bound to said part section (IDS-A, IDS-B).
- 10 4. The method as claimed in claim 3, wherein the part
sections (IDS-A, IDS-B) are partly complementary
to one another.
- 15 5. The method as claimed in any of the preceding
claims, wherein the primer binding sequence
sections (PBS1, PBS2) have the same melting point.
- 20 6. The method as claimed in any of the preceding
claims, wherein the nucleic acid sequences (N1-n)
are amplified, preferably by means of PCR and by
using fluorescent primers.
- 25 7. The method as claimed in any of the preceding
claims, wherein the nucleic acid sequences (N1-n)
are linked on at least one end to an agent which
counteracts degradation caused by exonuclease.
- 30 8. The method as claimed in any of the preceding
claims, wherein the nucleic acid sequence (N1-n)
is provided with a coupling group (A, B, C, D -
Z).
- 35 9. The method as claimed in any of the preceding
claims, wherein the coupling group (A, B, C, D -
Z) is selected from the following group [sic]:
biotin group, amino group, thiol group or hapten.

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10. The method as claimed in any of the preceding claims, wherein a molecule carrying a fluorophoric group (F11-n) is bound to the nucleic acid sequence (N1-n).
- 5 11. The method as claimed in any of the preceding claims, wherein the coupling group (A, B, C, D - Z) is labeled with a fluorophoric group.
- 10 12. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are bound to the substance (S1-n) and the substance (S1-n) used is one of the following agents: antibodies, lectins, receptors, nucleotide sequences, PNA sequences, peptides, proteins, sugars, ligands.
- 15 13. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) are bound to particles (P) or are included therein.
- 20 14. The method as claimed in any of the preceding claims, wherein the particles (P) are from 30 nm to 3 μ m in size.
- 25 15. The method as claimed in any of the preceding claims, wherein the particles (P) are silica, polystyrene, polyvinyl chloride, polyethylene, nylon or glass milk particles.
- 30 16. The method as claimed in any of the preceding claims, wherein the particle (P) is a viral capsid or a virus-like particle.
- 35 17. The method as claimed in any of the preceding claims, wherein each of the further nucleic acid sequences (N'1-n) is bound to a predefined site on

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a solid surface, preferably on a chip, a microtiter plate or film.

- 5 18. The method as claimed in any of the preceding claims, wherein hybridization of an identification sequence section (IDS1-n) with a complementary detection sequence section (IDP1-n) is detected by means of fluorescence.
- 10 19. The method as claimed in any of the preceding claims, wherein at least two nucleic acid sequences (N1-n) are added to the substance (S1-n) as a label.
- 15 20. The method as claimed in any of the preceding claims, wherein the nucleic acid sequences (N1-n) and/or the further nucleic acid sequences (N'1-n) are prepared synthetically.
- 20 21. The method as claimed in any of the preceding claims, wherein chimeras of nucleic acids and nucleic acid analogs, such as PTO or PNA, are used instead of the nucleic acid sequences or the further nucleic acid sequences.